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LETTER

Risk scores for predicting type 2 diabetes: using the optimal tool

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Abbreviation

ADDITION Anglo–Danish–Dutch Study of Intensive Treatment in People with Screen Detected Diabetes in Primary Care

To the Editor: In a recent commentary related to our paper on the performance of a risk score questionnaire for predicting future diabetes [1], Wareham and Griffin make an interesting point about the effect of real life response rates on the true performance of a risk assessment [2]. In our paper we evaluated the performance of the original Finnish diabetes risk questionnaire to predict future

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screen-detected and clinically diagnosed diabetes. We demonstrated that the performance of the risk score could be improved by adding information on sex, smoking and family history of diabetes [1]. In their commentary, Wareham and Griffin argue that non-response to a questionnaire should be taken into account when evaluating the performance of such a risk questionnaire. They state that when a risk questionnaire is posted out in real life, response rates may be only 50%, and the true sensitivity of the presented score would not be 76% but rather 38%. They go on to suggest that response rates can be improved to nearly 100% by using risk scores that are based on data contained in general practice databases, as has been done in the UK [3, 4], because they do not require collection of new data. They compare this with the 50% response rate for risk score questionnaires reported in the Anglo–Danish–Dutch Study of Intensive Treatment in People with Screen Detected Diabetes in Primary Care (ADDITION)–Denmark Study [5], but do not acknowledge that higher response rates have been achieved—for example 78% in the Hoorn Screening study [6].

The estimated 100% response rate suggested to be reached by using data from general practice databases ignores several important limitations to using these databases for calculating the risk of diabetes. Missing or inconsistently recorded information is a major problem when using databases. Although in the UK these general practice records have an impressively large amount of recorded data, information on all risk score items is required for calculation of a risk score. Body mass index has been reported to be recorded in approximately 75% of all persons [4], but information on other risk factors is required in addition to complete most risk scores. One solution to the problem of missing data is to remove one or more items from originally well-performing risk scores [7]. Ignoring risk score items that have a large proportion of missing data or data that are inconsistently recorded will reduce the predictive ability of a risk score and would need re-validation and calibration of the score. Another solution is to tag the person with missing data for opportunistic recording of the missing data at a later visit [7]. The effectiveness of this approach is unknown, but will not reach people who do not visit their general practitioner regularly. Furthermore, risk factors change over time and general practice information will need to be regularly updated. Another major barrier is that globally most healthcare systems do not have computerised primary practice and thus the capacity for central calculation of a risk score. For all these reasons the response rate will be well short of the 100% suggested by Wareham and Griffin even in situations where this method is an option.

In step-wise screening programmes, loss to follow-up is not only confined to the risk assessment step, irrespective of whether the risk score tool requires completion of a new form or is populated by data contained in a database, but also to when high-risk individuals are invited for further testing, for example (random) glucose measurement. In this second step, roughly similar response rates have been reported for those identified by self-report questionnaire or those identified in general practice records. Documented response rates vary from 77% in the ADDITION–Denmark trial [5] to 87% in the Hoorn Screening Study in the Netherlands [6] for those identified by self-assessed risk compared with 74% for those identified by general practice information [7].

There are a number of important considerations when screening for high risk of future diabetes in order to implement preventive interventions. Our paper focussed on the performance of the risk tool and we have shown that predictive ability of an existing popular risk tool can be improved with minor modifications. The commentary by Wareham and Griffin is a valuable reminder to take non-response in public health programmes seriously. Dealing with non-response is a major challenge in prevention programmes. It is critical that risk assessment has widespread reach to the target population. Many factors influence this process and further effort and research is required to maximise individual and community participation. Using information from general practice records is one approach, but is not the universal answer to this problem. The solution is not a choice between axes or spades but rather the use of both sharp axes and good spades.

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Duality of interest The authors declare that there is no duality of interest associated with this manuscript.

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